Remarks

Amendments to Claims 1, 5, 6, and 10

Claims 1, 5, 6, and 10 have been amended to recite: "sand removal members arranged to precipitate sand entrained in said air stream." The amendments are supported by the Specification on page 5, lines 1-6 and page 6, lines 6-11 and Figures 2-4 and 6.

The Rejection of Claims 1-10 Under 35 U.S.C. §103

The Examiner again rejected Claims 1-10 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 6,193,774 (Durdag et al.). Applicants respectfully traverse the rejection.

Durdag does not teach precipitation of sand entrained in an air stream

Durdag does not teach the amended Claim 1 element of: "...sand removal members arranged to precipitate sand entrained in said air stream."

A. Durdag does not teach, suggest, or motivate removal of any particulate from an air stream.

The Examiner has cited col. 1, lines 7-10 in Durdag as showing particulate removal and has referred to members 100, 102, 104, and 106 in Durdag as "particulate removal members," and cites col. 4, lines 21-24 as supporting this assertion. Applicants contend that there is no reference to particulates in the sections cited by the Examiner. A word-by-word analysis of col. 1, lines 7-10 and col. 4, lines 21-24 reveals that particulates are not mentioned or suggested and the Applicants challenge the Examiner to show such a reference in these citations.

Durdag does teach the decontamination of contaminated gases through the process of cooling these gases to condense gaseous contaminants into a liquid form. In the Background section, Durdag describes the problem: "After the heated gas passes over the printed circuit boards, various contaminants, for example, *alcohol, aldehydes, ketones, acids, rosins and resins* (emphasis added) are released into the oven and carried by the oven gas flow. These contaminants often foul the internal components and surfaces of the convection oven to the point that a thick, viscous, tacky *paste or fluid or residue* (emphasis added) is deposited on certain

components and surfaces." (col. 1, lines 24-31). Clearly, the compounds listed by Durdag cannot be considered "particulates" and particulates do not result in the "thick, viscous, tacky paste or fluid or residue" disclosed by Durdag.

Durdag presents his teachings regarding the identified problem as follows:

"Intake duct 42 is in fluid communication at distal end 56, FIG. 5, with the gas outtake 55 of heating zone 20 (and the gas outtakes of heating zones 24, and 26 as well as all the other zones) via the position of duct end 50 within the interior of oven 10, FIG. 1 at the high pressure region of the oven as shown to receive contaminated *convection oven gas* (emphasis added) 51." (col. 3, lines 56-62).

"Decontamination of *contaminated gas* (emphasis added) 51 occurs mainly in horizontally disposed decontamination ducts 44 and 46 due to cooling through the duct walls which can be enhanced by the use of heat sinks, and/or cooling gas, and/or by the use of the plurality of collision baffles 100, 102, 104, 106, etc., FIGS. 3, 4, 5, and 6." (col. 4, lines 17-21).

"Accordingly, the subject invention prevents the fouling of the oven by contaminants in the oven *gasses* (emphasis added) which previously *condensed or deposited* (emphasis added) on the various components and the oven surfaces." (col. 5, lines 51-54).

Thus, Durdag is teaching the removal of gaseous, not particulate, contaminants.

B. Durdag teaches decontamination of contaminated gases by cooling.

Durdag teaches a process completely unlike the precipitation of entrained sand recited in Claim 1. "Decontamination of contaminated gas 51 occurs mainly in horizontally disposed decontamination ducts 44 and 46 *due to cooling* (emphasis added) through the duct walls which can be enhanced by the use of heat sinks, and/or cooling gas, and/or by the use of the plurality of collision baffles 100, 102, 104, 106, etc., FIGS. 3, 4, 5, and 6." (col. 4, lines 30-42).

"...thus the contaminants *congeal, or condense* (emphasis added), onto the baffle surfaces. In addition, any contaminants which deposit on the interior of intake duct 42 is captured by *drip tray* (emphasis added) 112 and any contaminants which deposit on the interior of outtake duct 48 are captured by *drip tray* (emphasis added) 114. Cooling of the gas also reduces its kinetic energy which assists in the collection of contaminates." (col. 4, lines 35-39).

"The incoming convection oven gas within intake duct 42 was 250.degree.-270.degree. C., but by the time it reaches baffle 100 it has cooled to 150.degree.-180.degree. C., an optimal commencement temperature for the start of *condensing the contaminates*(emphasis added)." (col. 5, lines 40-44).

Durdag is clearly teaching that the contaminants are gaseous and that cooling is used to condense the contaminants to a liquid/paste form. That is, the contaminants are never in a particulate form: not while in the process gas stream and not when removed from the process gas stream.

C. Specifically, Durdag contains no teaching regarding removal of entrained sand.

Durdag discloses a solder convection oven, which has no structural elements in common with the thermal sand removal oven recited in Claim 1. "Reflow solder convection ovens are used in the production of printed circuit boards employing surface mount technology." (col. 1, lines 13-15). Thus, Durdag discloses an oven for an electronics fabricating operation, using entirely different materials (for example, solders and resins versus molding sand).

In fact, sand or any particulate matter would be inimical to a solder convection oven process. For example, consider the extremely costly and time-consuming steps taken to maintain "clean room" conditions for the production of electronic components.

The Examiner cannot define the term "contaminant" as used in Durdag

The Examiner presented a definition for "contaminant" in the Office Action. However, this is impermissible, as Durdag has unequivocally defined contaminants as being characterized by a gaseous state and having the property of congealing or condensing as gas temperatures are lowered: col. 3, lines 56-62; col. 5, lines 51-54; col. 4, lines 30-42; and col. 5, lines 40-44. Specifically, Durdag lists alcohol, aldehydes, ketones, acids, rosins and resins as contaminants in col. 1, lines 24-31. As the above citations show, Durdag's definition of contaminants clearly does not include particulates.

Assuming *arguendo* that the Examiner could define the term "contaminant" as used in Durdag, the definition presented by the Examiner is indefinite. The Examiner's definition includes the phrase: "intrusion or contact with dirt *or* (emphasis added) foulness.." What is the

basis for assuming that "dirt" rather than "foulness" is the applicable term?

Durdag does not suggest or motivate precipitation of sand entrained in an air stream

The first requirement to establish a *prima facie* case of obviousness is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. As noted above, Durdag discloses an oven used in an electronics fabricating operation, while Claim 1 teaches an oven associated with a metal-casting (i.e., heavy industry) operation. Further, Durdag is solving a problem of condensing gaseous contaminants to prevent fouling of internal surfaces. The present invention, however, is solving the problem of particulate removal to protect fans/blowers from damage. Thus, Durdag is solving a very different problem than the present invention, involving a process and equipment very different than that recited in Claim 1. Therefore, there is no motivation to look to Durdag regarding the problem of removing sand from a thermal sand removal oven.

Likewise, the fact that a modification would be within the ordinary skill of the art is not proof of motivation *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). That is, the obviousness rejection is based upon the Applicant's own invention characterization, not Durdag.

Further, the Examiner has not demonstrated that the cited the prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis.

With respect to the third requirement to support a *prima facie* case of obviousness, as noted above, Durdag does not disclose the following elements of Claim 1: a thermal sand removal oven; at least one metal casting encased in a sand mold; an air stream, resulting from a means to move air, traversing the at least one metal casting; a plurality of sand removal members in the air stream arranged to precipitate sand entrained in said air stream.

Applicants respectfully submit that Claim 1 is patentable over Durdag and Applicants respectfully request that the rejection be withdrawn. Claims 2-4, depend from Claim 1, which is patentable in light of the cited reference. Thus, Claims 2-4 are also patentable in light of the

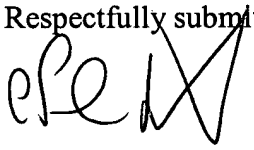
cited reference.

Applicants submit that the arguments for Claim 1 are applicable to Claims 5, 6, and 10. Therefore, Claims 5, 6, and 10 are patentable over Durdag and Applicants respectfully request that the respective rejections be withdrawn. Claims 7-9 depend from Claim 6, which is patentable in light of the cited reference. Thus, Claims 7-9 are also patentable in light of the cited reference.

Conclusion

Applicants respectfully submit that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,



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